

### **REMARKS/ARGUMENTS**

Reconsideration of the above-identified patent application in view of the amendments above and the remarks following is respectfully requested.

Claims 1-32 are in this application. Claims 2, 3, 7, 8, 18, 19, 23 and 24 have been rejected under 35 U.S.C. 112. Claims 1-10 and 17-32 have been rejected under U.S.C. 102(b). Claims 1-32 have now been cancelled. New claims 33-66 have now been added.

The claims before the Examiner are directed towards a ceramic composition and an article of manufacture comprising the ceramic, the ceramic comprising SiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, Fe<sub>2</sub>O<sub>3</sub>, CaO, TiO<sub>2</sub>, K<sub>2</sub>O and P<sub>2</sub>O<sub>5</sub>.

### **New Claims 33-66**

In confirmation of the Examiner's conversation with Mr. Cohen (the former attorney for the applicant) of October 14, 2002 Applicant herewith withdraws, without prejudice, claims 11-16, directed towards a method for producing a ceramic material.

In light of the Office Action mailed November 6, 2003 Applicant herewith cancels claims 1-32 and instead introduce new claims 33-66 the scope of which is substantially similar to that of the originally filed claims.

Support for the new claims is found in the specification and the originally filed claims. Specifically with reference to the published specification of the instant application (U.S. 2002/0132722) support for the new claims is found in:

Claims 33 and 48, *inter alia*, "between about 25.0% (paragraph 33) and about 57.0% (paragraph 32) by weight SiO<sub>2</sub>;  
between about 29.0% (paragraph 31) and about 45.0% (paragraph 33) by weight Al<sub>2</sub>O<sub>3</sub>;  
between about 0.3% (paragraph 33) and about 10% (paragraph 32) by weight Fe<sub>2</sub>O<sub>3</sub>;

between about 5.4% (paragraph 72) and about 34.0% (paragraph 69) by weight CaO;  
between about 0.6% (paragraph 32) and about 24.0% (paragraph 33) by weight TiO<sub>2</sub>;  
between about 0.2% (paragraph 33) and about 15.0% (paragraph 33) by weight K<sub>2</sub>O; and  
between about 0.3% (paragraph 33) and about 13.0% (paragraph 33) by weight P<sub>2</sub>O<sub>5</sub>”;

Claims 34 and 49, “greater than about 35.0% by weight SiO<sub>2</sub>” *inter alia*, in paragraph 31;

Claims 35 and 50, “less than about 50.0% by weight SiO<sub>2</sub>” *inter alia*, in paragraph 33;

Claims 36 and 51, “greater than about 30.0% by weight Al<sub>2</sub>O<sub>3</sub>” *inter alia*, in paragraph 31;

Claims 37 and 52, “less than about 36.0% by weight Al<sub>2</sub>O<sub>3</sub>” *inter alia*, in paragraph 31;

Claims 38 and 53, “greater than about 1.4% by weight Fe<sub>2</sub>O<sub>3</sub>” *inter alia*, in paragraph 31;

Claims 39 and 54, “less than about 6.0% by weight Fe<sub>2</sub>O<sub>3</sub>” *inter alia*, in paragraph 33;  
Claims 40 and 55, “greater than about 10.0% by weight CaO” *inter alia*, in paragraph 33;

Claims 41 and 56, “less than about 30.0% by weight CaO” *inter alia*, in paragraph 33;  
Claims 42 and 57, “greater than about 1.3% by weight TiO<sub>2</sub>” *inter alia*, in paragraph 31;

Claims 43 and 58, “less than about 15.2% by weight TiO<sub>2</sub>” *inter alia*, in paragraph 32;

Claims 44 and 49, “greater than about 0.3% by weight K<sub>2</sub>O” *inter alia*, in paragraph 32;

Claims 45 and 50, “less than about 11% by weight K<sub>2</sub>O” *inter alia*, in paragraph 32;

Claims 46 and 51, "greater than about 1.4% by weight  $P_2O_5$ " *inter alia*, in paragraph 31; and

Claims 47 and 52, "less than about 6.8% by weight  $P_2O_5$ " *inter alia*, in paragraph 31.

Claims 63 and 64, *inter alia*, "a plurality of oxides, said oxides selected from the group consisting essentially of group II oxides ( $SiO_2$ , paragraph 33), group III oxides ( $P_2O_5$ , paragraph 33), group IV oxides ( $CaO$ , paragraph 33), group V oxides ( $ZrO_2$ , paragraph 33) and lanthanoid oxides ( $CeO_2$ , paragraph 33) and having  
between about 25.0% (paragraph 33) and about 57.0% (paragraph 32) by weight  $SiO_2$ ;  
between about 24.0% (paragraph 72) and about 45.0% (paragraph 33) by weight  $Al_2O_3$ ;  
between about 0.3% (paragraph 33) and about 10% (paragraph 32) by weight  $Fe_2O_3$ ;  
between about 5.4% (paragraph 72) and about 34.0% (paragraph 69) by weight  $CaO$ ;  
between about 0.6% (paragraph 32) and about 24.0% (paragraph 33) by weight  $TiO_2$ ;  
between about 0.2% (paragraph 33) and about 15.0% (paragraph 33) by weight  $K_2O$ ; and  
between about 0.3% (paragraph 33) and about 13.0% (paragraph 33) by weight  $P_2O_5$   
wherein the composition is ceramic and substantially devoid of  $ZnO$  (paragraph 33)";

Claims 65 and 66, *inter alia*, "between about 25.0% (paragraph 33) and about 57.0% (paragraph 32) by weight  $SiO_2$ ;  
between about 24.0% (paragraph 31) and about 45.0% (paragraph 33) by weight  $Al_2O_3$ ;  
between about 0.3% (paragraph 33) and about 10% (paragraph 32) by weight  $Fe_2O_3$ ;  
between about 28.0% (paragraph 69) and about 34.0% (paragraph 69) by weight  $CaO$ ;  
between about 0.6% (paragraph 32) and about 24.0% (paragraph 33) by weight  $TiO_2$ ;  
between about 0.2% (paragraph 33) and about 15.0% (paragraph 33) by weight  $K_2O$ ; and  
between about 0.3% (paragraph 33) and about 13.0% (paragraph 33) by weight  $P_2O_5$ ";

**35 U.S.C. 112 Rejections**

The Examiner has rejected claims 2, 3, 7, 8, 18, 19, 23 and 24 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Applicant has composed new claims 33-66 in light of the Examiner's comments and therefore believes that the rejection under 35 U.S.C. 112, second paragraph is moot.

**35 U.S.C. 102(b) Rejections – Talmy *et al.* 5,521,132**

The Examiner has rejected claims 1, 3-6, 8-10, 17-18, 20-23 and 25-30 under 35 U.S.C. 102(b) as being anticipated by Talmy *et al.* 5,521,132. The Examiner's rejection is respectfully traversed.

Talmy *et al.* teaches a solid product comprising at least 85% by weight of ash. The majority of the ash is bound together by a matrix made by reacting sodium tetraborate, a calcium containing material and a portion of the ash (column 2, lines 10-14). Despite the use of the word "ceramic", the composition taught in Talmy *et al.* is not a ceramic. In contrast the scope of the claims before the Examiner is limited to ceramic materials.

Since Talmy *et al.* describes a non-ceramic composition, claims 33, 48, 63, 64, 65 and 66 are not anticipated by Talmy *et al.*

**35 U.S.C. 102(b) Rejections – Bajakin *et al.* (RU 2052400)**

The Examiner has rejected claims 1-10 and 17-32 under 35 U.S.C. 102(b) as being anticipated by Bajakin *et al.* (based on the English translation of abstract of RU 2052400). Applicant has translated Bajakin *et al.* (find attached) and therefore the Examiner's rejection is respectfully traversed.

Bajakin *et al.* provide a glass (not ceramic) composition that is made from an ash-slag waste substrate, where the ash-slag substrate contains by weight: 9%-54% CaO, 13%-75% SiO<sub>2</sub>, 5%-26% Al<sub>2</sub>O<sub>3</sub>, 1%-24% Fe<sub>2</sub>O<sub>3</sub>, 2%-6% MgO, 0.1%-1% Na<sub>2</sub>O, 0.2%-1% K<sub>2</sub>O, 0.1%-0.6% SO<sub>3</sub> and 0.2% TiO<sub>2</sub>. 3% and 8% graphite by weight is added to the molten substrate of Bajakin *et al.* During the vitrification process, the carbon reduces oxides in the ash-slag waste to carbides. Although it is hard to calculate the exact composition of the glass subsequent to reduction of the oxides (being dependent both on the composition of the ash and the amount of graphite added) it is clear that the lion's share of easy to reduce SiO<sub>2</sub> is reduced to carborundum.

In contrast, the first step in the preparation of a composition of the instant invention is to convert carbon to volatile CO<sub>2</sub> and thus prevent the formation of carbides. The proportions of the components of a composition of the instant invention are very similar to the proportions of the substrate.

Further, the composition of the present invention includes at least 0.6% TiO<sub>2</sub> (and even at least 1.3% TiO<sub>2</sub> according to claims 42 and 57) whereas the composition of Bajakin *et al.* includes only 0.2 % TiO<sub>2</sub>.

Although the teachings of Bajakin *et al.* are directed towards the formation of a glass, in passing is mentioned the possibility of converting the glass to ceramic by melting and cooling slowly (translation, page 2, lines 14-16). Bajakin *et al.* is mistaken.

First, as is well known to one skilled in the art, it is necessary to have a sufficient amount of crystallization catalyst in a composition. Bajakin *et al.* includes only 0.2% TiO<sub>2</sub> and does not mention the addition of any further crystallization catalyst. Under such conditions, no crystallization can occur.

Second, it is extremely unlikely that a composition that is a mixture of carbides and oxides, such as taught by Bajakin *et al.*, can crystallize into a ceramic. Although substantially pure carbide compositions or substantially pure oxide compositions can be used in preparing ceramics, a mixture will not readily crystallize, certainly not under conditions of simple slow cooling and certainly not under conditions with insufficient crystallization catalyst.

In conclusion, there are significant differences between the teachings of Bajakin *et al.* and the instant invention. Bajakin *et al.* teaches a composition having a significantly lower amount of SiO<sub>2</sub> and other oxides, replacing these with carbides. Further, the composition of Bajakin *et al.* has a significantly lower amount of TiO<sub>2</sub>. Further, although hinting at a ceramic composition as an option, it is doubtful that the composition of Bajakin *et al.*, a mixture of carbides and oxides, can crystallize into a ceramic certainly not under the conditions disclosed by Bajakin *et al.*

Since Bajakin *et al.* describes a glass having a different composition than that of the instant invention, claims 33, 48, 63, 64, 65 and 66 are not anticipated by Bajakin *et al.*

### **35 U.S.C. 102(b) Rejections – Santt (FR 2367027)**

The Examiner has rejected claims 1, 3-6, 8-10, 17-18, 20-23 and 25-30 under 35 U.S.C. 102(b) as being anticipated by Santt (FR 2367027). The Examiner's rejection is respectfully traversed.

Santt teaches a composition that contains many components. The composition most rich in Al<sub>2</sub>O<sub>3</sub> is one comprising 15% Al<sub>2</sub>O<sub>3</sub> to which is added 40% by weight phonolite (see claim 1 of Santt). As phonolite comprises 21% Al<sub>2</sub>O<sub>3</sub> (see table I in Santt), the final composition includes only 23.4% Al<sub>2</sub>O<sub>3</sub>. In contrast, the claims before the Examiner describe ceramic compositions comprising at least 24% Al<sub>2</sub>O<sub>3</sub>.

Since Santt describes a ceramic having a different composition than that of the instant invention, claims 33, 48, 63, 64, 65 and 66 are not anticipated by Santt.

**35 U.S.C. 102(b) Rejections – Dostal (GB 1459178)**

The Examiner has rejected claims 1, 3-6, 8-10, 17-18, 20-23 and 25-30 under 35 U.S.C. 102(b) as being anticipated by Dostal (GB 1459178). The Examiner's rejection is respectfully traversed.

*Concerning claims 33 and 48*

Dostal teaches of a ceramic comprising between 10% and 30%  $\text{Al}_2\text{O}_3$  (page 1 line 60). Further, Dostal teaches that it preferable to use no more than 25%  $\text{Al}_2\text{O}_3$  (page 1 line 85). In Dostal, Example 1 comprises 16%  $\text{Al}_2\text{O}_3$  and Example 2 comprises 16.5%  $\text{Al}_2\text{O}_3$ .

Claims 33 and 48 are directed to a ceramic comprising between about 29% and 45% by weight of  $\text{Al}_2\text{O}_3$ . Although Dostal formally teaches a ceramic comprising up to 30%  $\text{Al}_2\text{O}_3$ , practically Dostal teaches away from such a high  $\text{Al}_2\text{O}_3$  content. It is therefore the Applicants opinion that Claims 33 and 48 are not anticipated by Dostal.

Further, claims 36 and 51, dependent from claims 33 and 48, respectively, are directed to a ceramic comprising greater than 30% by weight of  $\text{Al}_2\text{O}_3$  and as such are not anticipated by Dostal. Although there is no literal support for the value 30% by weight of  $\text{Al}_2\text{O}_3$  in the specification of the instant application, in paragraph 31, *inter alia*, is noted that the  $\text{Al}_2\text{O}_3$  can be greater than 29% and 30% is greater than 29%.

*Concerning claims 63 and 64*

Dostal teaches of a ceramic comprising between 1% and 10% by weight of BaO and/or ZnO (page 1 line 64). Dostal notes that in the absence of BaO and/or ZnO, a ceramic cannot be formed (page 4 lines 27-32).

In contrast, claims 63 and 64 are directed to a ceramic comprising a plurality of oxides selected from the group consisting essentially of oxides of group II, group III, group IV, group V and lanthanoid elements. Further, ceramics of claims 63 and 64 are devoid of ZnO, that is, have substantially 0% ZnO (as noted, *inter alia*, in paragraph 33).

BaO is an oxide of a group VI element and so any composition of Dostal comprising BaO falls outside the scope of claims 63 and 64. Since any composition of Dostal devoid of BaO must include ZnO, and since such compositions also falls outside the scope of claims 63 and 64, claims 63 and 64 are not anticipated by Dostal.

*Concerning claims 65 and 66*

Dostal teaches of a ceramic comprising between 0.5% and 25% CaO (page 1 line 62). Further, Dostal advises against the use of greater than 21% CaO and preferably no more than 15% (page 1 line 87 to page 2 line 2). In contrast, claims 65 and 66 are directed to a ceramic comprising between about 28% and 34% CaO. Claims 65 and 66 are not anticipated by Dostal.

New independent claims 33, 48, 63, 64, 65 and 66 now feature language that is absolutely clear and that is neither anticipated by nor obvious in light of the art cited by the Examiner. Applicant is of the opinion that new claims 33, 48, 63, 64, 65 and 66, and



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consequently all claims dependent therefrom, are in condition for allowance. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'Sol Sheinbein', written over a horizontal line.

Sol Sheinbein  
Registration No. 25,547

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